Overview of EPA's Stormwater Rule Considerations

Stormcon
August 2012
U.S. EPA

Stormwater is a growing water quality concern

- Urban stormwater identified as source of impairment (2004 WQ Report)
  - 22,559 miles of impaired rivers and streams
  - 701,024 acres of impaired lakes
  - 867 square miles of impaired estuaries

- ~800,000 acres being developed every year, growing to ~1.2 million acres by 2040
- Development increases the amount of impervious cover in the landscape
  - Currently 100 million acres developed; **25%** is impervious
  - Discharge from 1 acre of impervious cover is **16x** the discharge from a 1 acre of undeveloped land
- Small increase in impervious cover leads to big impacts in receiving waters
  - Watersheds with <1-2% of impervious land area = biological impacts to surface waters
  - Watersheds with >5-15% of impervious land area = surface water declines rapidly to degraded levels, loss of function; Loss in base flow in streams and groundwater recharge

Stormwater Pollution & Hydrologic Impacts

Pollution Impacts

- Beach closures and swimming illnesses
- Polluted fisheries and shellfish harvesting
- Accumulated sediments in drinking water reservoirs
- Increased costs of treating drinking water supplies
- Trash accumulation inhibiting navigation channels

Destroys transportation infrastructure

"Storm Water Runoff is a Drain on Cleveland Metroparks as They Battle Erosion"

Degrades culverts and exposes infrastructure

Erodes bed & bank of streams and destroys aquatic habitat

Increased stormwater volumes exceed system capacity and degrades infrastructure

Increases local flooding – basement flooding

Smarter Stormwater Management

Past approach

- Convey stormwater quickly from site to MS4 system, detention pond or directly to waterbody.
- Manage peak flows for flood control, drainage and large scale downstream erosion.

New approach

Integrate green infrastructure in the design of the project

- View stormwater as a resource.
- Slow down the flow, allow to infiltrate.
- Reduces pollutant loads to waterbodies.
- Obtain multiple community benefits.

Green Infrastructure Approaches

Green infrastructure practices infiltrate, evapotranspire and harvest and use the rain water.

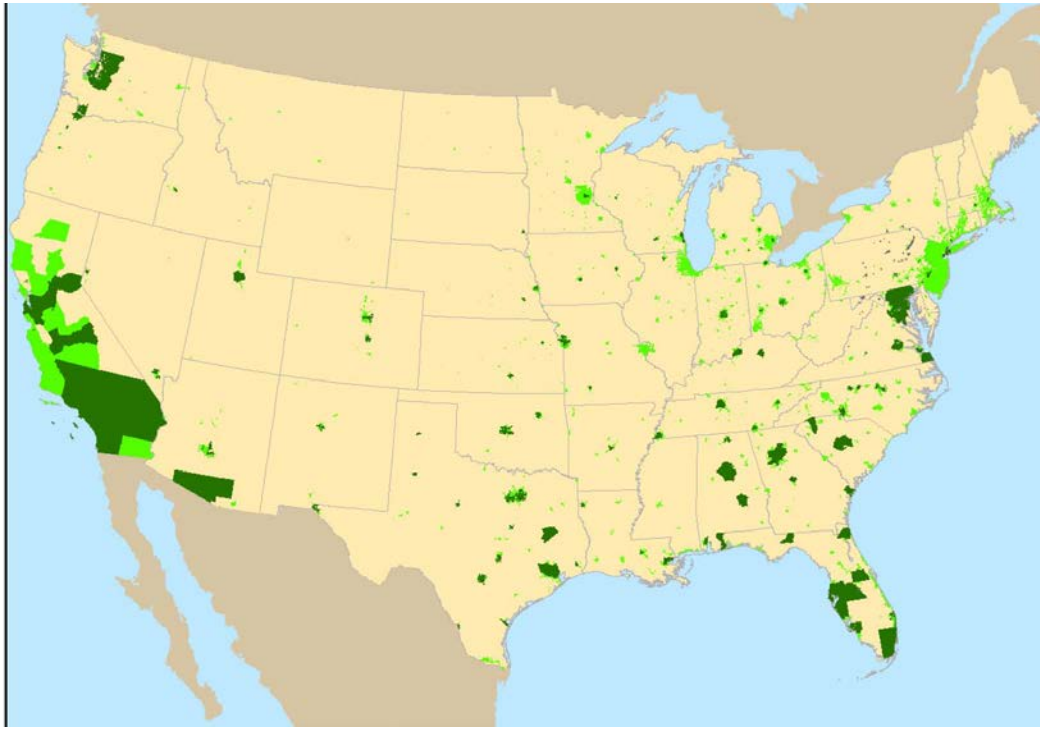
- Reduce impervious cover in parking & street designs
- Bioretention/rain gardens
- Permeable pavements
- Green roofs
- Cisterns & rain barrels
- Trees & expanded tree boxes
- Reforestation & restoration

Proper operation and maintenance must be ensured.

2009 NRC Report: Urban Stormwater Management in the U.S.

- Current approach unlikely to produce an accurate picture of the problem and unlikely to adequately control stormwater's contribution to waterbody impairment
  - Requirements leave a great deal of discretion to dischargers to ensure compliance
- "A more straightforward way to regulate stormwater contributions to waterbody impairment would be to use flow or a surrogate, like impervious cover, as a measure of stormwater loading …."
- "Efforts to reduce stormwater flow will automatically achieve reductions in pollutant loading. Moreover, flow is itself responsible for additional erosion and sedimentation that adversely impacts surface water quality."
- "Stormwater control measures that harvest, infiltrate, and evapotranspirate stormwater are critical to reducing the volume and pollutant loading of small storms."

Current MS4 Program



Map of current coverage (green)

- Primarily in urbanized area
- Accounts for much of the population
- Only 2% of the land area

Regulated Entities

- Medium and Large MS4s > 100,000 pop.
- Small MS4s in urbanized areas

MS4 Permit Requirements

- Public Education & Outreach
- Public Participation
- Illicit Discharge Detection and Elimination
- Pollution Prevention/Good Housekeeping
- Active Construction Program
- **Post construction program for new development and redevelopment sites ≥ 1 acre**
  - **General requirement**
  - **No performance standards required**

Key Elements of the Proposed Rule

1. Establish performance standards for discharges from newly developed and redeveloped sites.
2. Require certain regulated MS4s to develop a program to address discharges from existing sites (retrofits).
3. Extend protection of MS4 Program.
4. Designating Government-Owned Maintenance Yards as Industrial Sources.

Element 1: Performance Standards

Why · What · Who · When · How · Where

EPA is considering a retention-based performance standard to reduce pollutants resulting from the increased volume and velocity of stormwater discharges at newly developed and redeveloped sites.

The volume of stormwater retained is a surrogate for the pollutants contained in the discharge.

Retention vs. Detention:

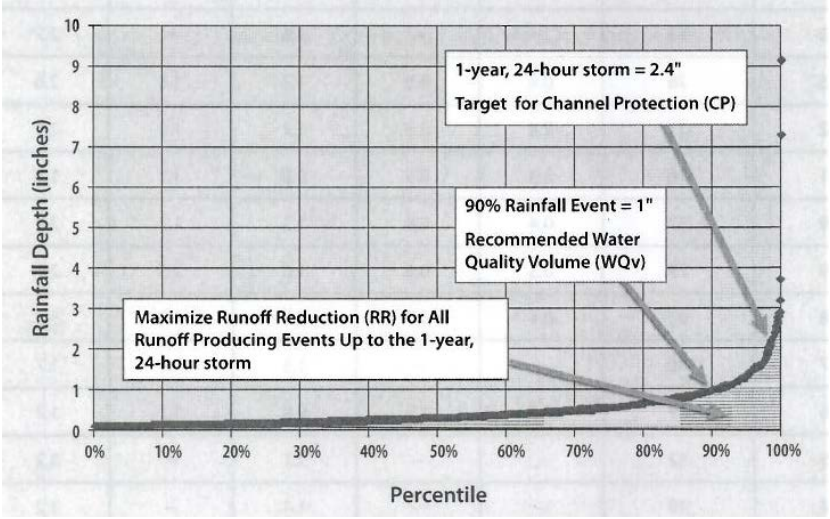
- Volume retention is critical to pollutant load reduction – net pollutant mass load removal is achieved through infiltration and corresponding runoff removal reduction for all water quality parameters.
  - Because detention and treatment alone does not reduce the volume of the discharge, the pollutant load removal that is achieved through retention is higher.

- A performance-based approach was selected in lieu of a prescriptive water quality requirement in order to provide site designers maximum flexibility in selecting control practices appropriate for the site.

Element 1: Performance Standards

Why · What · Who · When · How · Where

- A standard based on a specific percentile storm event was chosen to approximate natural hydrological conditions on the site (most sites retain small storms between the 85th and 95th percentile storms under natural conditions)
  - Approach is sensitive to varying climatic conditions across the country
  - Easily implemented by developers
- Rule could allow site-specific natural hydrologic analysis, however minimum treatment of 85th percentile storm could be required to reduce pollutant loading
  - Because post construction surface produces more pollutants even if results in same runoff volume



Rainfall Frequency Spectrum for Minneapolis, MN. Center for Watershed Protection, 2008

Element 1: Performance Standards

Why · What · Who · When · How · Where

Why:

- New and redevelopment presents an opportunity for stormwater management practices at sites to be designed in a way that protects water quality.
  - More cost effective to prevent the impacts and protect water quality and avoid costly retrofits later.

Current Volumetric Retention Standards for Discharges from New Development

State or Locality (date enacted)	Size Threshold	Standard
Montana (2009)	1 acre	Infiltrate, evapotranspire, or capture for reuse runoff from first 0.5" of rain
Wisconsin (2010)	1 acre	Infiltrate runoff to achieve 60% -90% of predevelopment volume based on impervious cover level
West Virginia (2009)	1 acre	Keep and manage on site 1" rainfall from 24-hour storm preceded by 48 hours of no rain
California	1 acre	Manage 85th percentile
Anchorage, AK (2009)	10,000 sq ft	Keep and manage the runoff generated from the first 0.52 inches of rainfall from a 24 hour event preceded by 48 hours of no measureable precipitation.

Additional Flexibilities Under Consideration for the Performance Standard

- States could also develop alternative programs that are better suited to their needs, but that are as protective as the national standard.
- There could be a delay in the implementation of the performance standard following promulgation of the rule to allow time for municipalities to do activities such as: update codes and ordinances to allow for green infrastructure practices, including developments with reductions in impervious cover

Element 1: Performance Standards

Why · What · Who · When · How · Where

How:

- The standard could be met by reducing impervious cover and/or installation of stormwater controls which infiltrate, evapotranspire and harvest and use the rain water.
- Proper operation and maintenance must be ensured.
- Standard could accommodate site constraints: volume that cannot be retained on site could be managed through treatment, off-site mitigation in the same subwatershed or payment in lieu.
- Site constraints could include water rights laws.

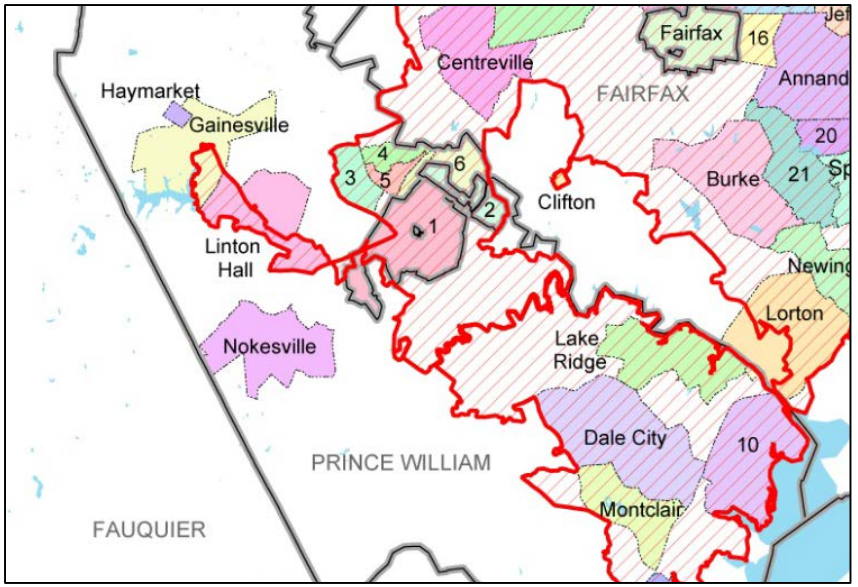
Pervious Paver Parking Stalls, Redlands, CA.
Photo courtesy of Jeff Endicott.

Element 1: Performance Standards

Why · What · Who · When · How · Where

Where:

- The standard could be applied to newly developed and redeveloped sites nationwide or only those sites discharging to regulated MS4s.
- Applying the standard nationwide would create a level playing field for developers among municipalities and protect downstream communities from upstream development.



District of Columbia Metro Area Urbanized Area Map US Census 2000 (red hatched)

Element 1: Performance Standards

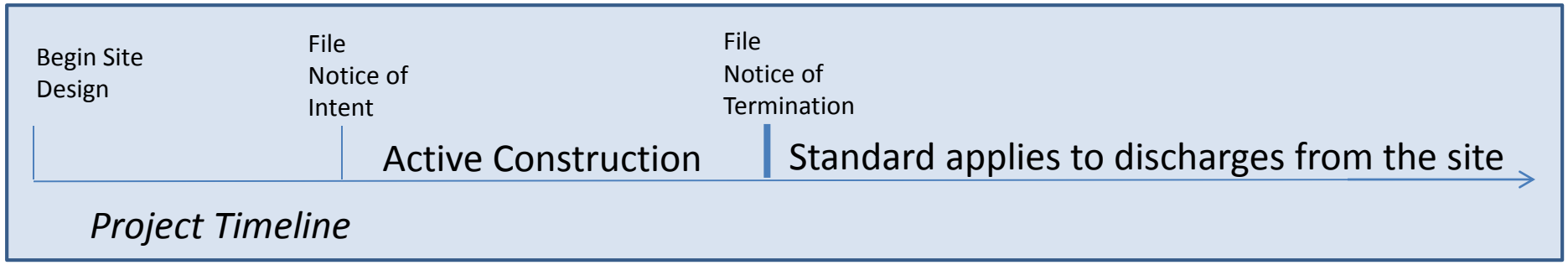
Why · What · Who · When · How · Where

Who:

- All types of construction projects including residential, commercial, industrial, and institutional.
- Owner of a construction project which meets the site size threshold.
  - Current site size threshold in the MS4 program is projects which disturb one acre or more; or less than one acre if the project is part of a greater plan of development.
- Responsibility for proper operation and maintenance transfers to new owners of a property.

When:

- Stormwater discharges after construction is complete.
- Cost effective ways to meet the standard
  - Incorporate controls in the site design by preserving vegetation, reducing impervious cover
  - Integrate green infrastructure practices into landscape or other areas which would manage the specified volume in the standard.



Element 1: Performance Standards

Discharges from Redeveloped Sites

- Recommend lower standard for redevelopment
  - Recognize site constraints
  - To encourage redevelopment to revitalize urban communities
  - Considering additional incentives for smart growth and brownfields development

LA Infiltration Planters. *Photo courtesy of Bill DePoto.*

Element 2: Municipal Program to Manage Discharges from Existing Sites (Retrofits)

- Address existing degradation from existing sites and help restore urban waters
- Proposed approach could require certain regulated municipalities to:
  - Identify long term goals, highest priority projects and milestones
  - Integrate green infrastructure into projects cities are already doing
  - Implemented through an iterative approach as part of stormwater management plan
- Could Apply to:
  - Regulated MS4s serving 100,000 population or greater
  - Regulated MS4s serving 50,000 population or greater
  - Could allow exemptions where MS4 discharges do not cause or contribute to violations of water quality standards

Retrofit Projects

Curb Extension

Green Roofs

Downspout Disconnection

Vacant Land Program

BEFORE

AFTER

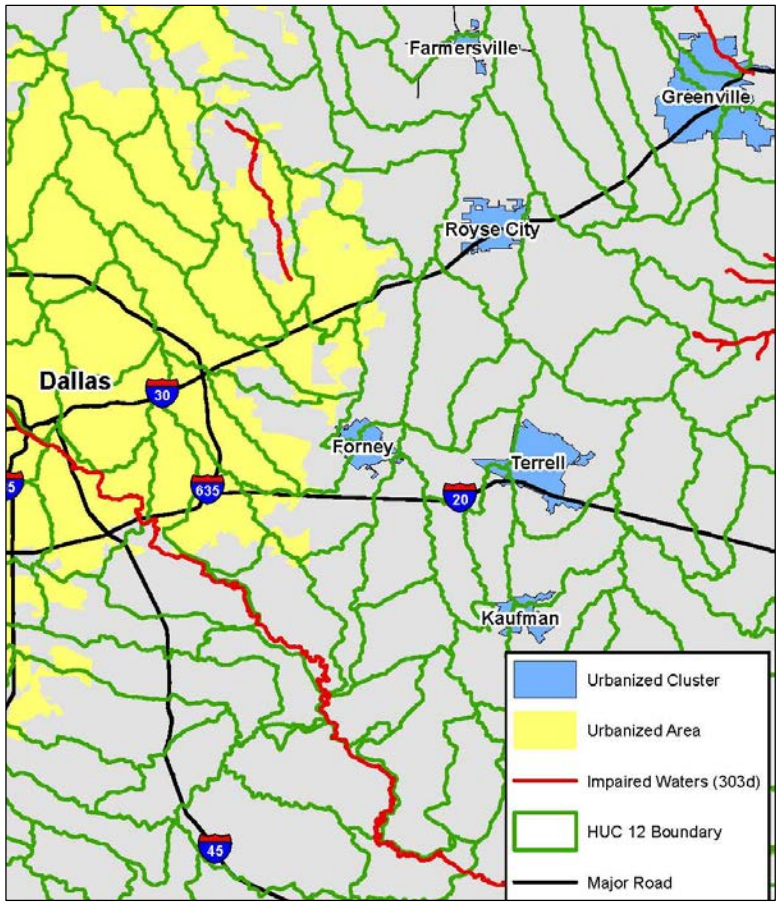
Element 3: Extending the Protection of the MS4 Program

- Helps ensure standards are properly implemented which could reduce need for expensive retrofits later
- Builds on existing framework of local oversight
- Implements 6 minimum measures which help prevent contamination

- Options

  1. Urbanized clusters as defined by Census (density of 1,000 people/mi^2)
     - Reaches unregulated densely populated areas
     - Could specify a population threshold

  2. Small watershed (HUC 12) which overlap with urbanized area
     - Reaches areas of high growth
     - Promotes watershed approaches
     - Could specify a population threshold



Element 3: Extending the Protection of the MS4 Program to All Principal Arterial Roads

Federal Highway Administration Category: roads which connect urbanized areas with more than 50,000 people and urban areas

- 61% of principal arterials are currently regulated

- Rulemaking could extend the MS4 program to the remaining 39% of principal arterials

- 12 states currently apply the MS4 program to all state-owned roads
  - –Arizona, California, DC, Illinois, Michigan, Nevada, New Jersey, New Mexico, North Carolina, Oregon, South Carolina, Tennessee, Utah

Element 4: Designating Government Owned Maintenance Yards as Industrial Sources

- Vehicle and equipment maintenance is a regulated industrial activity, except for municipal maintenance yards
  - These facilities often are given public administration SIC codes or some other non-regulated code not representative of their industrial nature
  - Activities that could generate pollutants include: vehicle / equipment fluid changes; mechanical repairs; parts cleaning; sanding; refinishing; painting; fueling; cleaning; storage of vehicles/ equipment waiting for maintenance; and storage of the related materials and waste materials, such as oil, fuel, batteries, tires or oil filters.
  - Pollutants of concern include organic and inorganic chemicals; fuels, such as coal and oil; paints; metals; solvents; and oil and grease.
- 1995 *Storm Water Discharges Potentially Addressed by Phase II of the NPDES Storm Water Program, Report to Congress* identified government maintenance yards as one of the major unregulated sources

Switch from the Standard Industrial Classification (SIC) code system to the North American Industrial Classification System (NAICS)

- Phase I stormwater rule identified regulated industry by narrative descriptions and 1987 U.S. Census Standard Industrial Classification (SIC) system.
  - The SIC was poorly suited for use in environmental regulating because it was based on economic criteria and not strictly on similar industrial activities or materials used/ generated.

- NAICS replaced SIC as the classifying standard in 1997 (since revised in 2002 and 2007); improved SIC deficiencies by grouping together industries that use the same or similar processes to produce goods or services.

- EPA analyzed NAICS to correlate it to the SIC system and so unintentional changes in the types of entities covered did not result.

Rulemaking Schedule

Proposal: June 2013
Final Action: December 2014

www.epa.gov/npdes/stormwater/rulemaking